LASER-PRODUCED PLASMA EUV LIGHT SOURCE WITH PREPULSE ENHANCEMENT

ABSTRACT OF THE DISCLOSURE

An EUV radiation source that employs a low energy laser pre-pulse and a high energy laser main pulse. The pre-pulse generates a weak plasma in the target area that improves laser absorption of the main laser pulse to improve EUV radiation emissions. High energy ion flux is reduced by collisions in the localized target vapor cloud generated by the pre-pulse. Also, the low energy pre-pulse arrives at the target area 20-200 ns before the main pulse for maximum output intensity. The timing between the pre-pulse and the main pulse can be reduced below 160 ns to provide a lower intensity of the EUV radiation. In one embodiment, the pre-pulse is split from the main pulse by a suitable beam splitter having the proper beam intensity ratio, and the main pulse is delayed to arrive at the target area after the pre-pulse.